Quick Guide

FLOODPLAIN MANAGEMENT IN NORTH DAKOTA

NORTH DAKOTA
STATE WATER COMMISSION
www.swc.nd.gov

2016

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ABOUT THIS GUIDE

This **Quick Guide** will help you understand more about why and how communities in the State of North Dakota manage floodplains to protect people and property. North Dakota's floodplain management programs have been active since 1981. Floodprone communities adopt ordinances that detail the rules and requirements of developing in the floodplain. In case of conflict, that ordinance and not this publication, must be followed. If you have questions, be sure to talk to your local planning or permitting office.

The North Dakota State Water Commission (SWC) coordinates the National Flood Insurance Program in North Dakota. Questions and comments on the **Quick Guide** can be directed to the NDSWC at (701) 328-2750. More information about North Dakota's Floodplain Management is on the web at *www.swc.nd.gov*.

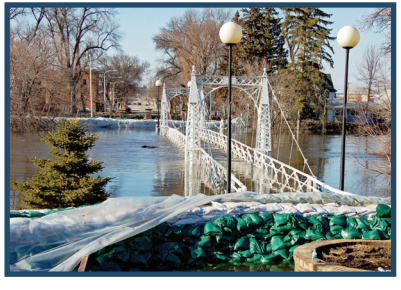
The North Dakota State Water Commission and the Office of the State Engineer are pleased to provide this floodplain management **Quick Guide** informational tool to citizens and community officials.

Counties and local communities regulate the floodplain to:

- **Protect** people and property
- **Reduce** future flood losses
- **Ensure** that federal flood insurance and disaster assistance is available
- **Save** tax dollars
- **Reduce** liability and law suits

Floods have been, and continue to be, a destructive natural hazard in terms of economic loss to the citizens of North Dakota. Since 1978, Federal flood insurance policy holders in North Dakota have received over $250 million in claim payments. Floodprone areas have been identified in most of North Dakota's counties, cities, and towns.

FLOOD INSURANCE: A PROPERTY OWNER'S BEST PROTECTION



Who needs flood insurance? **EVERYONE!** Every homeowner, business owner, and renter in any of the North Dakota communities that participate in the National Flood Insurance Program may purchase a flood insurance policy – **regardless** of the location of the building. Federal disaster grants do not cover most losses and repayment of a disaster loan can cost many times more than the price of a flood insurance policy.

Unfortunately, it's often after a flood that many people discover that their property insurance policies do not cover flood damages. Approximately 20% of all flood damages occur in low-to-moderate risk areas, commonly described as being outside the special flood hazard area.

The North Dakota State Water Commission urges YOU to protect your financial future by getting a flood insurance policy.

To purchase a policy, call your insurance agent. To get the name of an agent in your community, call the NFIP's toll free number 1 (888) 379-9531 or visit www.floodsmart.gov.

WHAT IS THE NATIONAL FLOOD INSURANCE PROGRAM?

The National Flood Insurance Program (NFIP) was created by Congress in 1968 to mitigate future flood losses and to provide access to federally back flood insurance protection for property owners. The NFIP is administered by the Federal Emergency Management Agency (FEMA). Nationwide, over 21,000 communities participate in the NFIP – including most of North Dakota's communities.

The NFIP is based on a mutual agreement between the Federal Government and local communities. Communities that participate agree to regulate floodplain development according to certain criteria and standards. The partnership involves:

- **Flood Hazard Maps.** FEMA prepares maps that are used by communities, insurance agents, and others.
- **Floodplain Management/Regulations.** Communities must adopt and enforce minimum floodplain management regulations so that development, including buildings, is undertaken in ways that reduce exposure to flooding (see page 6).
- **Flood Insurance.** Property owners in participating communities are eligible to purchase federal flood insurance for buildings and contents.

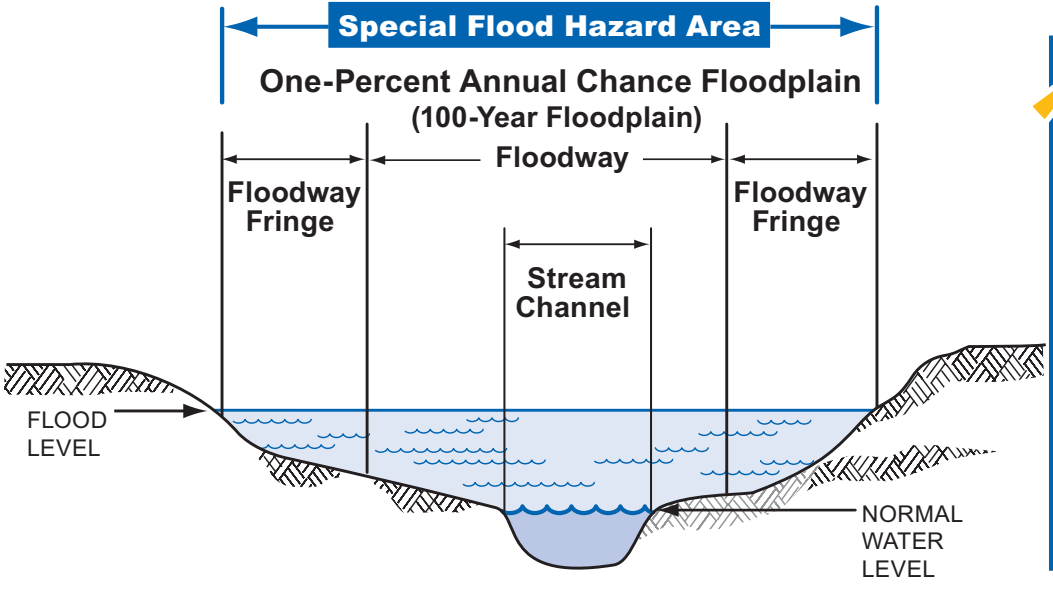
To learn more about the NFIP, including your potential flood risk and the approximate cost of a flood insurance policy, go to FEMA's FloodSmart website at *www.floodsmart.gov*.

WHY DO WE REGULATE THE FLOODPLAIN?

- **To protect people and property.** Floodplain management is about building smart and reducing our vulnerability to flooding. If we know the land will flood from time to time, we should make reasonable decisions to help protect our families, homes, and businesses.
- **To reduce future flood losses in North Dakota.** Floodplain development regulations are simply a "good neighbor" policy designed to protect our citizens from future flood losses. Regulating floodplain development helps keep flooding conditions from worsening as development continues.
- **To make sure federal flood insurance and disaster assistance is available.** Your community must join the NFIP before its residents can purchase federal flood insurance. Therefore, in non-participating communities, residents may be unable to secure a mortgage. In addition, your community can be ineligible for some types of federal assistance.
- **To save tax dollars.** Every flood disaster affects your community's budget. If we build smart, we'll have fewer problems the next time the water rises. Remember, federal disaster assistance isn't available for all floods. Even when the President declares a disaster, your community still has to pay a portion to cover the costs of evacuation, temporary housing, repair, and cleanup.
- **To avoid liability and lawsuits.** If we know an area is mapped as floodplain and likely to flood, if we know people could be in danger, and we know that buildings could be damaged, it makes sense to take reasonable protective steps when we develop and build in such an area.

To participate in the National Flood Insurance Program and to be compliant with State floodplain management requirements, your community agrees to:

- **Adopt and enforce** a flood damage prevention ordinance
- **Require** permits for all types of development in the floodplain (see page 22)
- **Assure** that building sites are reasonably safe from flooding
- **Require** new or improved homes to be elevated one foot above the Base Flood Elevation (BFE)
- **Require** non-residential buildings to be elevated or floodproofed 2 feet above the BFE
- **Conduct** field inspections and cite violations of the ordinance
- **Require** Elevation Certificates to document compliance (see pages 30-31)
- **Carefully** consider requests for variances
- **Advise** FEMA when updates to flood maps are needed

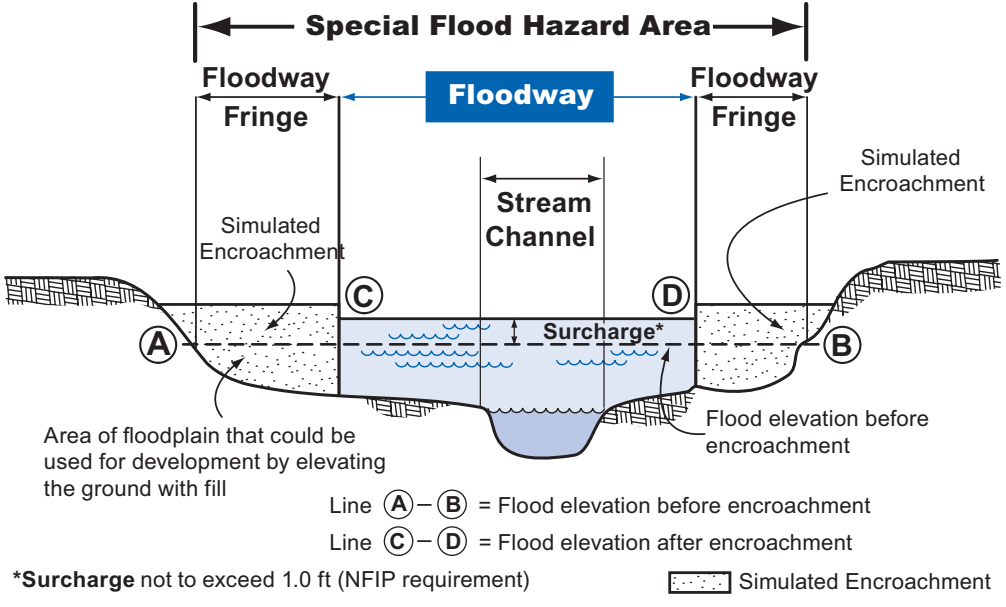


Terms and Definitions

The **Special Flood Hazard Area (SFHA)** is that portion of the floodplain subject to inundation by the base flood and/or flood-related erosion hazards. SFHAs are shown on FIRMs in ND as Zones A, AE, A1-A30, AH, AO, and AR.

See page 8 to learn about the floodway, the area of the floodplain where floodwaters usually flow faster and deeper.

For floodplains with Base Flood Elevations, check the Flood Profiles, located in the Flood Insurance Study (FIS). These graphs show water surface elevations for a variety of return interval events (see page 16).



Terms and Definitions

The **Floodway** is the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to pass the base flood discharge without increasing flood depth.

Computer models of the floodplain are used to simulate "encroachment" or fill in the flood fringe in order to predict where and how much the base flood elevation would increase if the floodplain is allowed to be filled.

Before a local floodplain permit can be issued for proposed development in the floodway, the applicant must provide evidence that "no rise" (page 34) will occur or obtain a Conditional Letter of Map Revision (CLOMR) from FEMA. You will need a qualified engineer to make sure your proposed project will not increase flood levels.

NO ADVERSE IMPACT AND NATURAL FLOODPLAIN FUNCTIONS

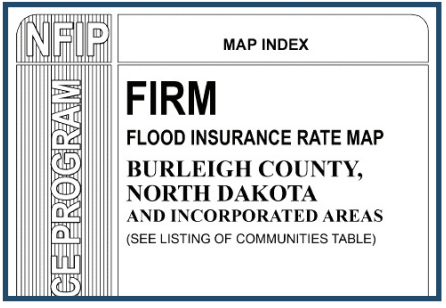
"No Adverse Impact" (NAI) floodplain management is essentially a "do-no-harm" policy based on the concept that the actions of any community or property owner should not adversely affect others. It calls for identifying the potential direct and indirect adverse impacts of any development action on people, property, and the environment. Adverse impacts must be avoided or mitigated.

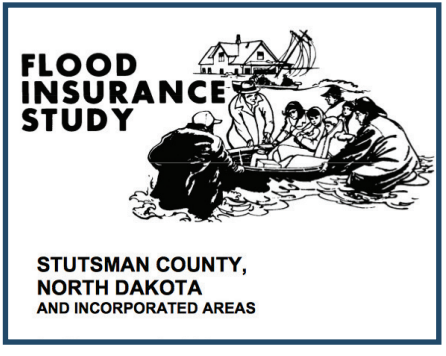
Undeveloped floodplains can serve natural and beneficial functions. They:

- Store floodwater and stormwater.
- Enhance water quality by filtering runoff through wetlands.
- Offer habitats for plants and animals.
- Sustain biological productivity.
- Reduce erosion and sediment runoff.
- Offer recreation opportunities.

The Association of State Floodplain Managers, Inc. developed the NAI concept in response to rising flood damages, even by communities that administer floodplain management ordinances. At *www.floods.org*, click on the NAI tab to download publications, the NAI Tool Kit, and PowerPoint presentations, as well as several documents about legal issues.

LOOKING FOR FLOODPLAIN INFORMATION?





View and download digital flood maps at the FEMA Map Service Center at www.msc.fema.gov.

FEMA prepares Flood Insurance Studies and Flood Insurance Rate Maps (FIRMs) for North Dakota's communities.

Most FIRMs show special flood hazard areas and floodways developed by a detailed analysis while other FIRMs show floodplains delineated using only approximate analyses (see page 18).

While following FEMA's quality assurance and quality control procedures, flood hazard studies may be prepared by local governments, state and federal agencies, or by engineering companies working for private property owners and developers.

Not all waterways have designated floodplains – but all waterways will flood, even though a floodplain study may not have been prepared.

Flood Maps and Flood Insurance Studies should be available for viewing at your local planning or permitting office.

High-Risk Areas (Special Flood Hazard Area or SFHA)

In high-risk areas, there is at least a 1 in 4 chance of flooding during a 30-year mortgage. All home and business owners in these areas with mortgages from federally regulated or insured lenders are required to buy flood insurance. The SFHA is also referred to as the 100-year or base flood event. This area is shown on the flood maps as zones labeled with the letter “A”.

Moderate-To-Low Risk Areas (Non-Special Flood Hazard Area or NSFHA)

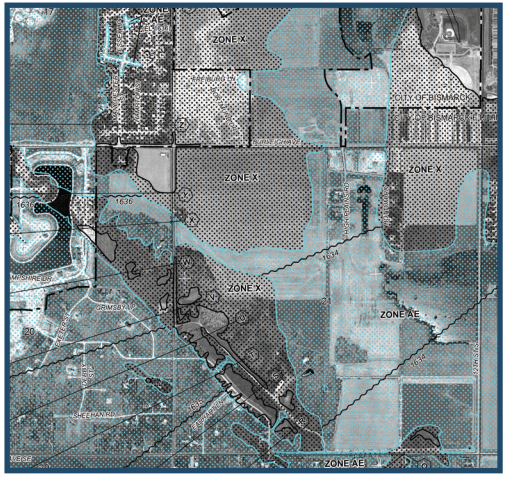
In moderate-to-low risk areas, the risk of being flooded is reduced but not completely removed. These areas submit over 20% of NFIP claims and receive one-third of disaster assistance for flooding. Flood insurance isn’t federally required in moderate-to-low risk areas, but it is recommended for all property owners and renters. They are shown on flood maps as zones labeled with the letters “B”, “C”, or “X” (shaded or unshaded).

Undetermined-Risk Areas

No flood hazard analysis has been conducted in these areas, but a risk of flooding still exists. Flood insurance rates reflect the uncertainty of the flood risk. These areas are labeled with the letter “D” on the flood maps.

FEMA's Flood Map Service Center

You can view FIRMs and print clips from FIRMs called FIRMettes by using FEMA's online tools on the FEMA Map Service Center website at **www.msc.fema.gov**.

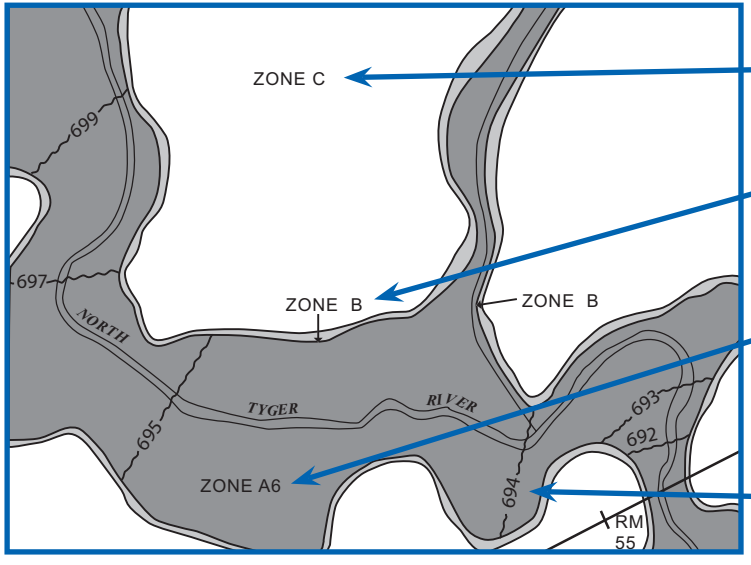


From the Map Service Center you can:

- **Locate** a FIRM by state, county, and community or by FIRM panel number.
- **Zoom** in or out to view a specific area of a FIRM.
- **Create** a FIRMette showing a specific area of a FIRM, the FIRM Title Block, north arrow, and FIRM approximate scale.
- **Print** the FIRMette.
- **Save** the FIRMette as an Adobe PDF or an image file.
- **Click** on "What is a FIRMette?" on the Map Service Center web page for detailed instructions on how to make a FIRMette.

From the Map Service Center you can also purchase a CD-ROM containing the FIRMs and related information for your community.

OLD FORMAT FLOOD INSURANCE RATE MAP



FLOOD HAZARD ZONES

Zone C (or Zone X) is all areas considered to be low risk.

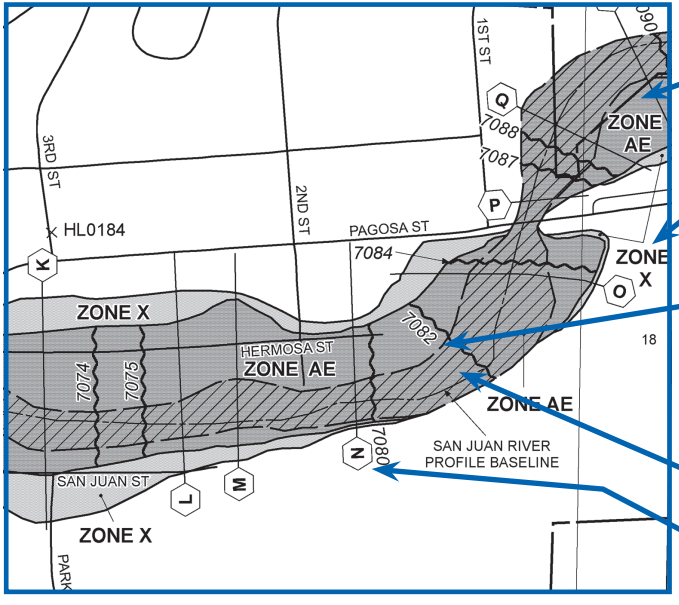
Zone B (or shaded Zone X) is subject to flooding by the 0.2% annual chance (500-year) flood, and is a moderate risk area.

Zone A, Zones A1-A30 and Zone AE are subject to flooding by the base or 1% annual chance (100-year) flood, and are considered high risk areas.

Base Flood Elevation (BFE) is the water surface elevation, rounded to the nearest foot, of the 1% chance flood event at specific locations.

FEMA prepares Flood Insurance Rate Maps (FIRMs) to show areas that are at high risk of flooding due to storm or snow melt. Most FIRMs show the flood elevation (how high the water may rise), called the Base Flood Elevation (BFE).

CURRENT FORMAT FLOOD INSURANCE RATE MAP



FLOOD HAZARD ZONES

Zone AE is the 1%-annual chance (100-year) floodplain with BFEs (also called Zone A1-A30).

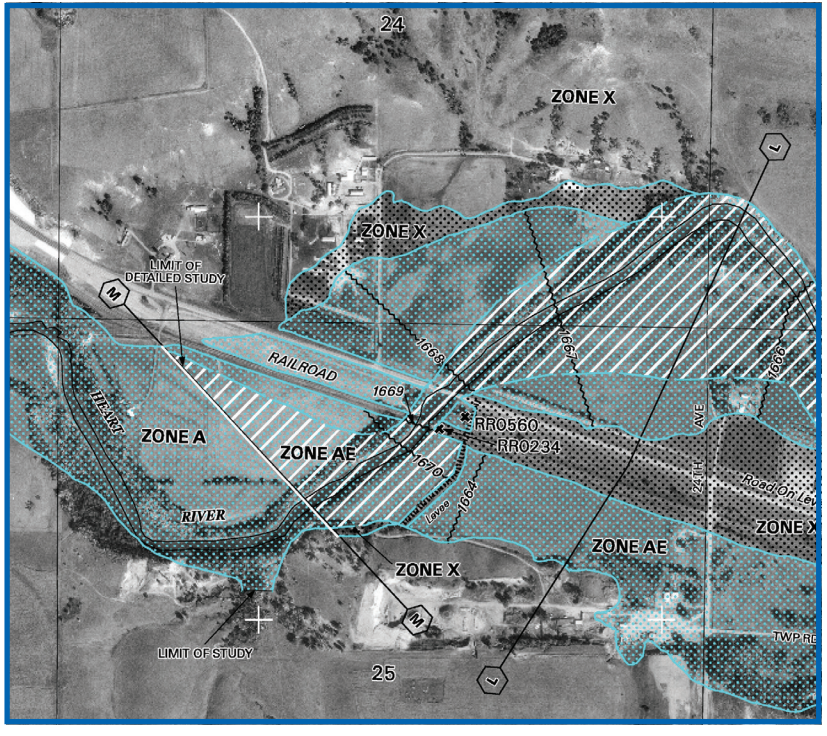
Zone X (shaded or unshaded) is all other areas considered moderate-to-low risk (formerly Zone B or C).

Base Flood Elevation (BFE) is the water surface elevation, rounded to the nearest foot, of the 1% chance flood event at specific locations.

The **Floodway** is the cross-hatched area.

Cross Section location. Associated elevations can be found in the Flood Insurance Study.

THE COUNTYWIDE DIGITAL FIRM

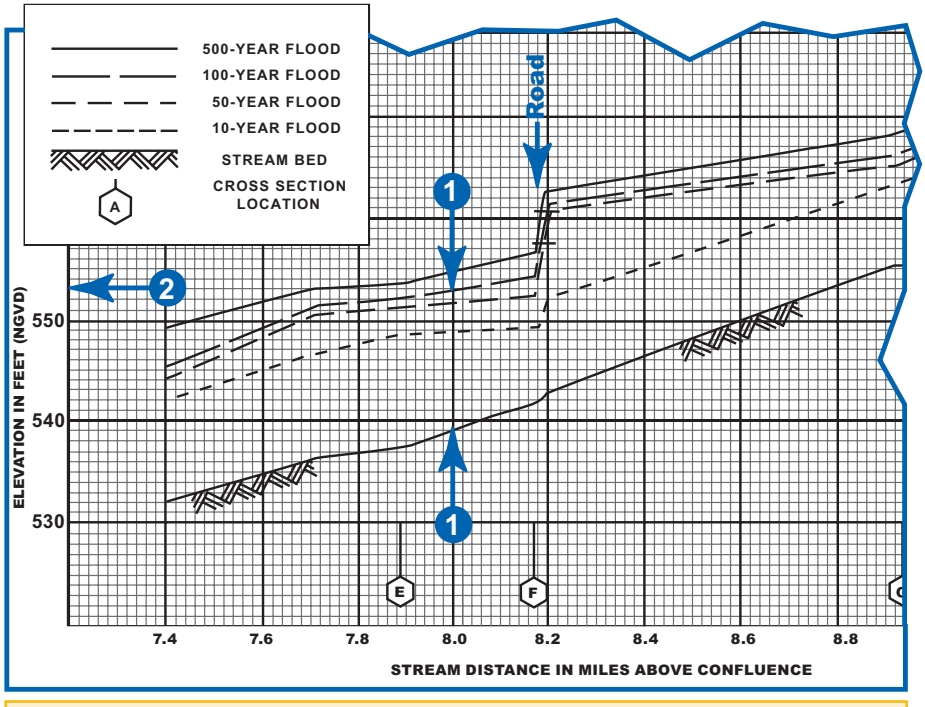


FEMA, in cooperation with state, local, and business partners is producing countywide Digital Flood Insurance Rate Maps (DFIRMs) through the Risk Mapping, Assessment, and Planning (Risk MAP) program.

DFIRMs are in an industry-standard Geographic Information System (GIS) format, that allows users to view information in a graphical format and add or remove layers of data according to their needs.

The flood risk zones, street names, jurisdictional boundaries, and other data can be overlaid on aerial photographs. The new map format enables more efficient and accurate flood risk determinations.

USING THE STREAM FLOOD PROFILE TO DETERMINE BFES



In this example, at 8 miles above the confluence, the BFE is 553 feet.

The Flood Insurance Study (FIS) includes flood profiles that can be used to determine the BFE at a specific site. Profiles also show estimated water surface elevations for floods other than the 1% annual chance flood.

1. On the Flood Insurance Rate Map, locate your site by measuring the distance along the centerline of the stream channel from a cross section, for example E or F.

2. Scale that distance on the flood profile and read up to the profile of interest, then across to determine the elevation.

FLOODWAY DATA TABLES

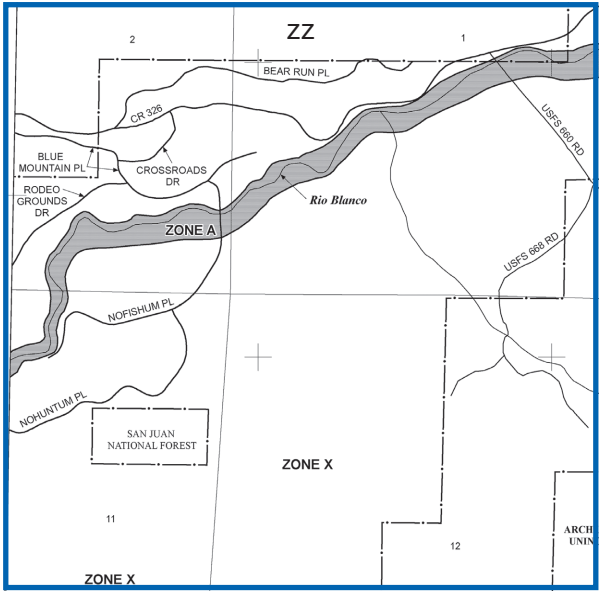
The Floodway designates a portion of the SFHA that must be reserved to convey the base flood without increasing the water surface elevation more than the amount specified in the Floodway Table.

The Flood Insurance Study (FIS) has a Floodway Table for every waterway that was studied by detailed methods for which floodways were delineated.

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET NGVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Rocky River								
A	4,395	115	1,233	6.1	9.9	9.9	10.0	0.1
B	5,537	13	142	9.2	10.4	10.4	10.5	0.1
C	9,610	100	323	8.4	10.9	10.9	11.1	0.2
D	10,995	85	861	7.2	11.2	11.2	11.3	0.1
E	12,695	245	1,887	5.1	11.3	11.3	11.4	0.1
F	13,845	270	2,403	4.5	11.5	11.5	11.5	0.0
G	14,513	230	2,553	3.7	11.6	11.6	11.6	0.0
H	16,625	180	2,000	4.2	11.7	11.7	11.7	0.0
I	18,209	415	2,566	3.9	12.5	12.5	12.7	0.2
J	20,849	230	2,381	4.0	13.0	13.0	13.2	0.2
K	25,360	340	2,924	3.6	14.0	14.0	14.2	0.2
				(1)	(2)			(3)

1. This is the only readily available velocity data to use in computation of hydrodynamic loads.
2. Computed BFE (rounded values are shown on the FIRM).
3. Amount of allowable increase – not more than 1 foot for older studies and 0.5 foot for new studies at any location.

APPROXIMATE ZONE A



Topographic maps can be used to estimate the BFE.

Approximate A Zones are drawn based on existing information, not engineering studies. FEMA checked with the U.S. Army Corps of Engineers, the U.S. Geological Survey, the State, local offices, and historic records for best available data. When existing information was lacking, an approximate delineation was performed.

As of 2014, FEMA now requires all A zones to have modeled-back engineering data.

If you need help in determining the BFE, check with the North Dakota State Water Commission or your community's planning, engineering, or permitting office. FEMA publication *Managing Floodplain Development in Approximate Zone A Areas* (FEMA 265) is useful for engineers.

CAPTURING FLOODPLAIN CHANGES

The cornerstone of reliable floodplain management is good floodplain mapping.

If the current map shows only approximate flood information, and you want to develop the land, your community may require you to provide new floodplain information. If development proposals involve more than 5 acres or 50 lots, then federal regulations require permit applicants to provide detailed information.

New engineering studies typically are required for some projects that involve changing the floodplain, for example placing large quantities of fill or altering a waterway.

Development in the regulatory floodway comes with additional requirements. Before a permit may be issued, the community responsible for permitting such use shall notify the State Engineer and seek his/her approval. Additional technical data, including a functioning hydraulic model may be needed.

Contact your local Floodplain Administrator for advice on flood information and permits. Reference the North Dakota Century Code and the Code of Federal Regulations, Title 44 for additional guidance.

FLOOD MAP REVISIONS - LETTERS OF MAP CHANGE

1. **Letter of Map Amendment (LOMA)** is an official change to an effective FIRM that may be issued when a property owner provides additional technical information, such as ground elevation relative to the BFE, SFHA, and the structure. Lenders may waive the flood insurance requirement if the LOMA documents a structure on ground above the base flood elevation.

2. **Letter of Map Revision (LOMR)** is an official change to an effective FIRM that may be issued to change flood insurance risk zones, floodplain, boundary delineations, BFEs, and/or other map features. Lenders may waive the flood insurance requirement if the approved map revision shows the structures to be outside of the SFHA.

3. **Letter of Map Revision Based on Fill (LOMR-F)** is an official change to an effective FIRM that is issued to document FEMA's determination that a structure or parcel of land has been elevated above the BFE by the placement of fill, and therefore is no longer in the SFHA. Lenders may waive the flood insurance requirement if the LOMR-F shows a structure on fill is above the BFE and outside of the SFHA. Areas removed from the floodplain by a LOMR-F are subject to development regulations.

4. **Physical Map Revision (LOMR-PMR)** may be issued for major physical floodplain changes that require engineering analyses, such as bridges, culverts, channel changes, flood control measures, and large fills that change the BFE or Floodway. PMRs are also issued when a new study updates or improves the FIRM.

Important Information

Check FEMA's Flood Hazard Mapping website for more information about map revisions.

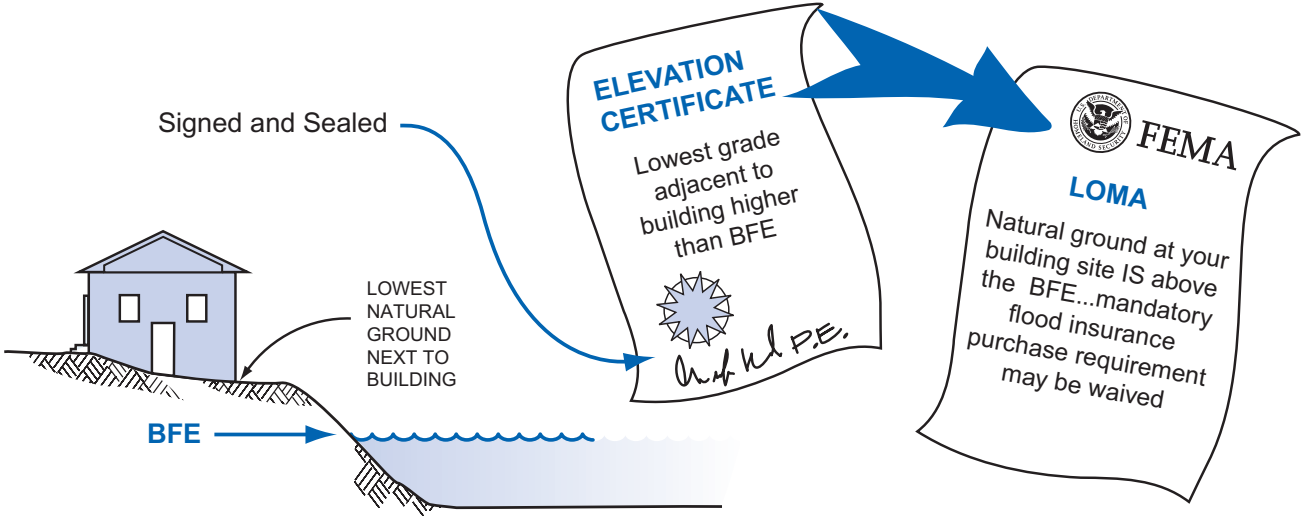
To learn the status of Map Change Requests, call FEMA's **Map Service Center**: 1-877-FEMA-MAP (1-877-336-2627).

Information:
http://www.fema.gov/status-map-change-requests

Forms:
http://www.fema.gov/forms

Requests for map revisions must be endorsed by the local community.

IS YOUR BUILDING SITE HIGHER THAN THE BFE?



If your land is shown on the map as "in" the floodplain, but your building site is higher than the Base Flood Elevation (BFE)… get a surveyor or engineer to complete a FEMA Elevation Certificate (EC). Submit the EC with an application to FEMA and a Letter of Map Amendment may be issued (page 20).

This is the **ONLY** way to remove the requirement to buy flood insurance.

Keep the certificate with your deed, it will help future buyers.

ACTIVITIES REQUIRING FLOODPLAIN PERMITS

- Constructing new buildings
- Additions to existing buildings
- Substantially improving existing buildings
- Placing manufactured (mobile) homes
- Subdivision of land
- Temporary buildings and accessory structures
- Agricultural buildings
- Parking or storage of recreational vehicles
- Storing materials, including gas/liquid tanks
- Roads, bridges, and culverts
- Fill, grading, excavation, mining, and dredging
- Altering stream channels

A permit is required for **ALL** of these activities, if located in the SFHA.

SOME KEY PERMIT REVIEW STEPS

The Permit Reviewer has to check many things before the permit is issued. **Some of the key questions are:**

- Is the site in the mapped floodplain?
- Is the site in the mapped floodway?
- Have other state and federal permits been obtained?
- Does the site plan show the Base Flood Elevation?
- Is substantial improvement of an older building proposed?
- Is an addition proposed?
- Will new buildings and utilities be elevated properly?
- Will manufactured homes be properly elevated and anchored?
- Do the plans show an appropriate and safe foundation?
- Has the owner submitted an Elevation Certificate?

CAREFULLY COMPLETE THE PERMIT APPLICATION

Owner's Name: DAVID & SALLY JONES

Site Address, Tax #, Parcel #: 781 REED STREET, 400-35A-002

A. Description of Work

1. Proposed Development Description:

- [x] New Construction
- [ ] Alteration or Repair
- [x] Filling
- [ ] Grading
- [ ] Dredging
- [ ] Manufactured/Modular
- [ ] Logging
- [ ] Other

2. Size and Location of Development

SINGLE FAMILY (2,000 CY FILL);
FLOOD FRINGE OF OAK CREEK

3. Type of Construction

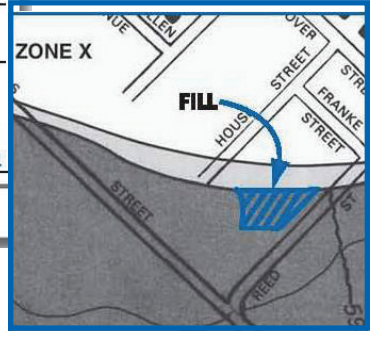
- [x] New Residential
- [ ] New Non-Residential
- [ ] Addition
- [ ] Improvement
- [ ] Renovation
- [x] Accessory structure
- [ ] Temporary

Community, Map, and Elevation Data:

1. Community No: 570171
2. Panel No: 5720512700J
3. Zone AE
4. Base Flood Elevation 59.2
5. Required Lowest Floor Elevation (including basement) 60.2
6. If floodproofed, required floodproofing elevation N/A
7. Elevation to which all attendant utilities, including all heating, duct work, and electrical equipment will be installed or floodproofed: 60.2

Applicant's Signature: David M. Jones

Part of a Sample Application
(may vary by community)



Important Information

You must get all permits **before** you do work in a floodplain.

Good information will lead to better construction and less exposure to future flood damage.

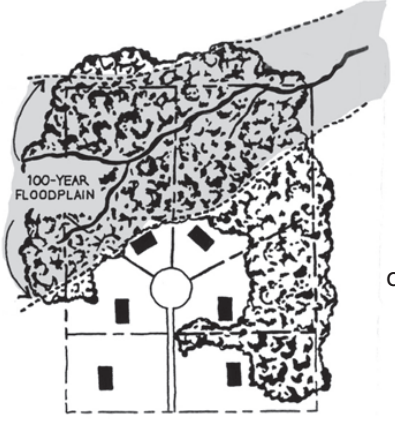
SAFE USES OF THE FLOODPLAIN

All land subdivided into lots, some home sites and lots partially or entirely in the floodplain.

NOT RECOMMENDED

All land subdivided into lots, some lots partially in the floodplain with setbacks to keep home sites on high ground.

RECOMMENDED

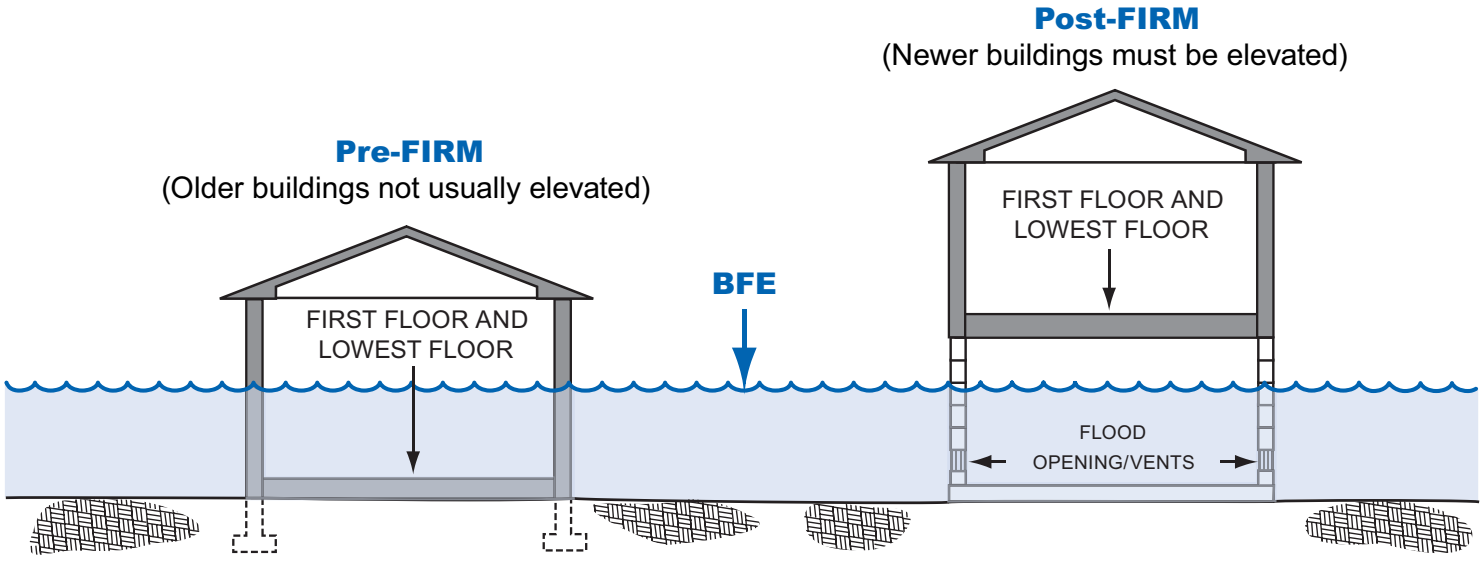


Floodplain land put into public/common open space, net density remains, lot sizes reduced, and setbacks modified to keep home sites on high ground.

RECOMMENDED

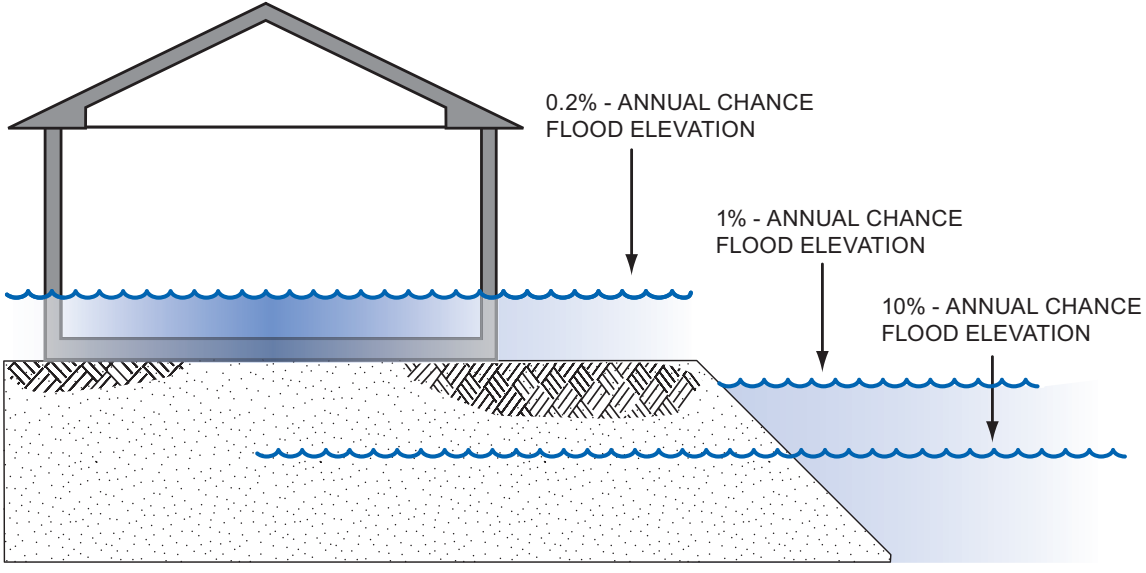
Let the floodplain do its job – if possible, keep it natural, open space.
Other low damage uses: recreational areas, playgrounds, reforestation, parking, gardens, pasture, accessory structures, or created wetlands.

WHAT IS MEANT BY PRE-FIRM AND POST-FIRM?



A building is **Pre-FIRM** if it was built **before** the date of your community's first FIRM. If built after that date, a building is **Post-FIRM**. Find the initial FIRM date online at www.fema.gov/cis/ND.html or call your community's planning, engineering or permitting office. Improvements or repairs to Pre-FIRM buildings may require permits (see page 22).

NATURE DOESN'T READ MAPS



Important

Information

Flash floods are the #1 weather-related killer in the U.S., since they can roll boulders, tear out trees, and destroy buildings and bridges. A flash flood is a rapid flooding of low-lying areas in less than six hours, which is caused by intense rainfall from a thunderstorm. Flash floods can also occur from the collapse of a man-made structure or ice jam.

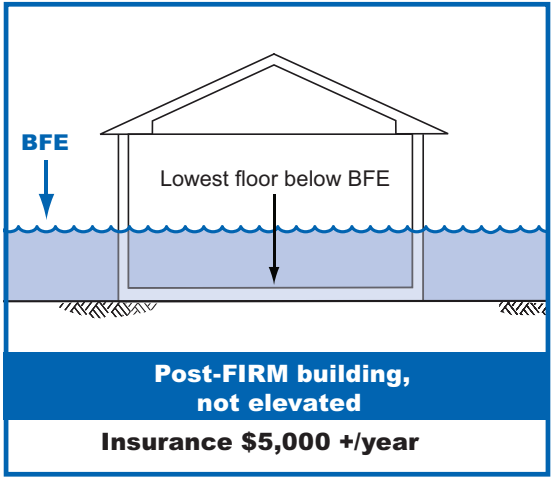
CAUTION! Nature doesn't read flood maps! Major storms, snow melt, and flash floods can cause flooding that rises higher than the 1% annual chance or BFE. Consider safety – protect your home or business by building higher. See page 29 to see how this will save you money on insurance.

THINK CAREFULLY BEFORE YOU SEEK A VARIANCE

Very specific conditions must be satisfied to justify a variance:

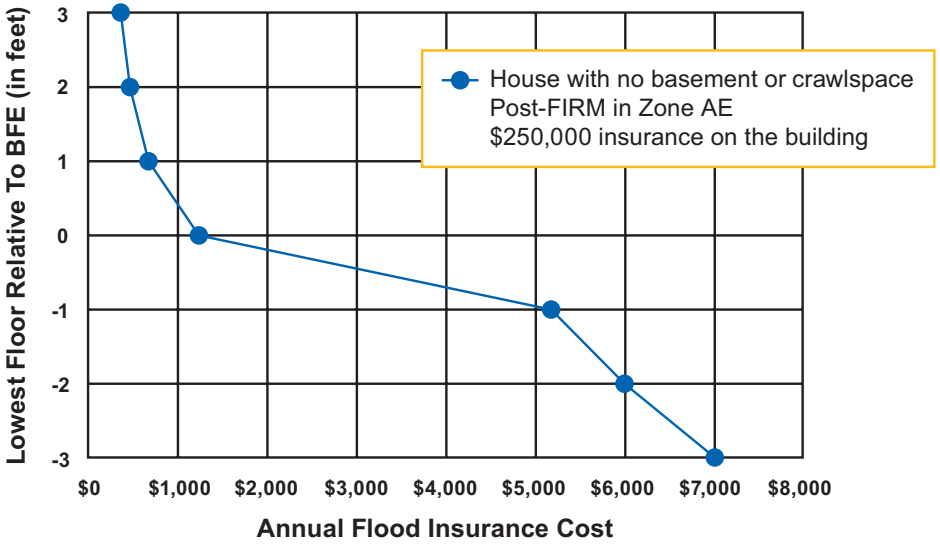
- Good and sufficient cause
- Unique site conditions
- Individual non-economic hardship
- No increase in flood level if in the floodway

A variance that allows construction below the BFE does **not** waive your lender's flood insurance requirement. Flood insurance will be **very** expensive – perhaps more than $5,000 per year (see page 29)!



Think carefully about seeking a variance to build below the Base Flood Elevation. Not only will your property be more likely to get damaged, but insurance will be very costly. If your community has a pattern of inconsistent variances, sanctions can be imposed – costing you even more!

FREEBOARD: GO THE EXTRA FOOT!



Want to save some money and have peace of mind at the same time? Then add freeboard to build higher than the minimum elevation requirement! Freeboard is a factor of safety, usually one or two feet above the BFE. **In North Dakota, one foot of freeboard is required** for residential and non-residential structures while critical facilities have a higher standard.

Important

Information

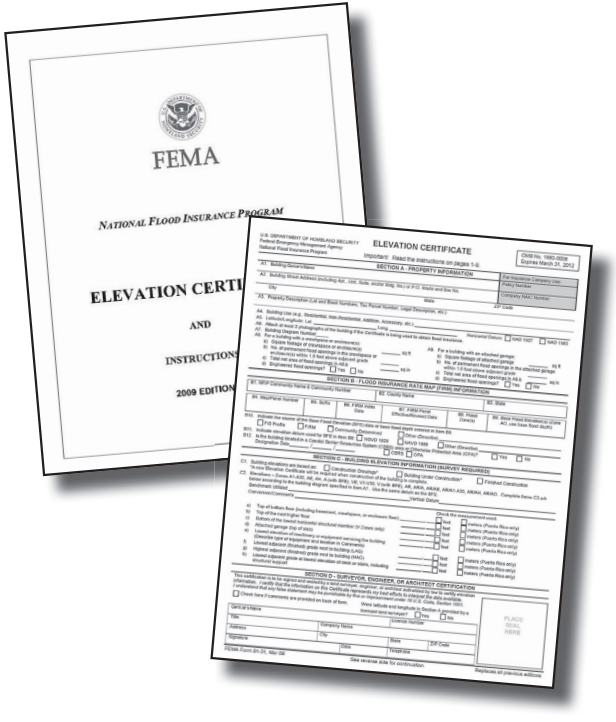
Flood insurance rates and various fees change from time to time. Rather than specific costs for insurance, this figures gives a feel for how much difference just a foot or two can make.

Building owners will save insurance money if they elevate above the BFE. But more impressive is how the cost of insurance can more than double if the building is only one foot below the BFE.

Remember!

The community may be able to grant a variance, but the owner will probably still be required to buy insurance. Imagine trying to sell a house if the bank requires insurance that costs over $5,000 a year!

WHAT IS THE ELEVATION CERTIFICATE?



- The Elevation Certificate (EC) is a FEMA form. Download a copy from the FEMA website www.fema.gov/forms.
- The EC must be completed and sealed by a registered surveyor or engineer when the floodplain has BFEs.
- A community official or property owner may complete the EC for sites in approximate flood zones.
- It can be used to confirm that structures are on natural ground and above the Base Flood Elevation (see page 21).
- It is used to verify that buildings are elevated properly.
- Insurance agents use the EC to write flood insurance policies.
- By itself, the EC cannot be used to waive the requirement to get flood insurance. See page 20 to learn about Letters of Map Amendment.

COMPLETING THE ELEVATION CERTIFICATE

SECTION C - BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

C1. Building elevations are based on: ☐ Construction Drawings* ☐ Building Under Construction* ■ Finished Construction
*A new Elevation Certificate will be required when construction of the building is complete.

C2. Elevations – Zones A1-A30, AE, AH, A (with BFE), VE, V1-V30, V (with BFE), AR, AR/A, AR/AE, AR/A1-A30, AR/AH, AR/AO. Complete Items C2.a-h below according to the building diagram specified in Item A7. Use the same datum as the BFE.

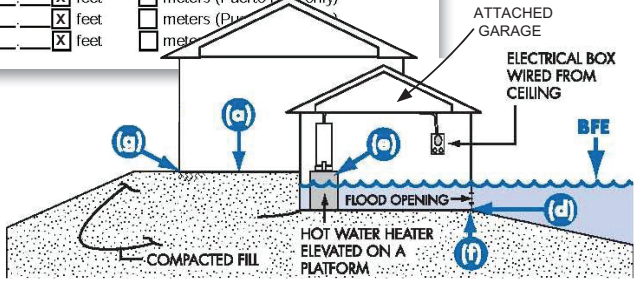
Benchmark Utilized BM66 Vertical Datum NAVD 1988

Conversion/Comments

			Check the measurement used.	
a)	Top of bottom floor (including basement, crawlspace, or enclosure floor)	4,286	X feet	☐ meters (Puerto Rico only)
b)	Top of the next higher floor	N/A	☐ feet	☐ meters (Puerto Rico only)
c)	Bottom of the lowest horizontal structural member (V Zones only)	N/A	☐ feet	☐ meters (Puerto Rico only)
d)	Attached garage (top of slab)	4,282	X feet	☐ meters (Puerto Rico only)
e)	Lowest elevation of machinery or equipment servicing the building (Describe type of equipment and location in Comments)	4,286	X feet	☐ meters (Puerto Rico only)
f)	Lowest adjacent (finished) grade next to building (LAG)	4,286	X feet	☐ meters (Puerto Rico only)
g)	Highest adjacent (finished) grade next to building (HAG)	4,286	X feet	☐ meters (Puerto Rico only)
h)	Lowest adjacent grade at lowest elevation of deck or stairs, including structural support	4,286	X feet	☐ meters (Puerto Rico only)

In this example, the BFE is at 4,285 feet.

The slab-on-grade house was elevated on fill 1' above the BFE, and the vented garage is 3' below the BFE.

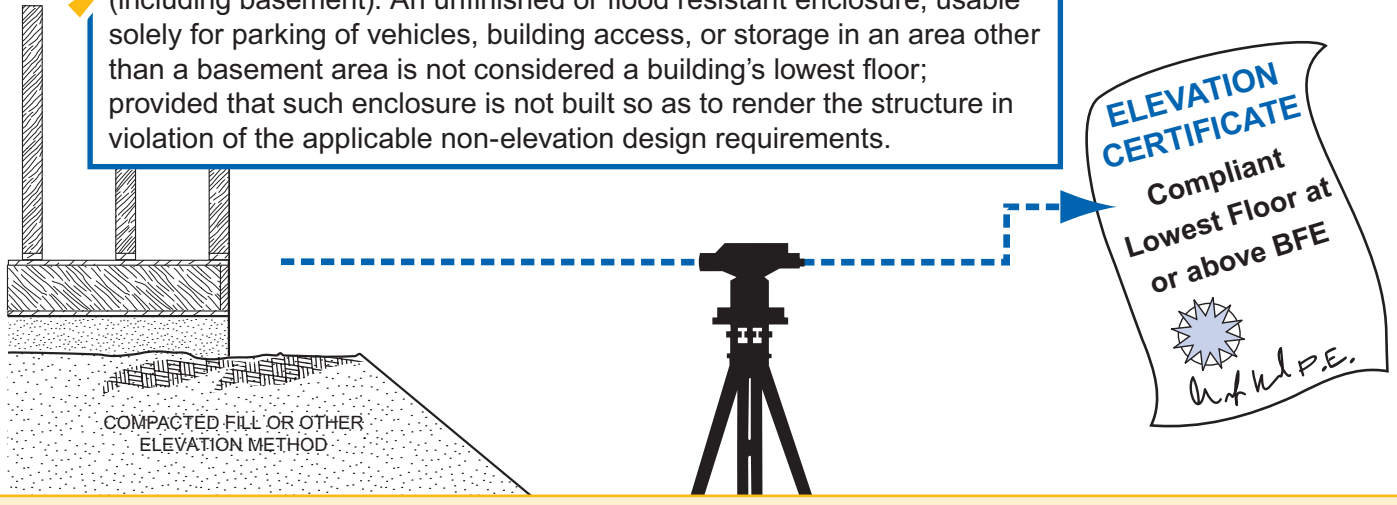


The Elevation Certificate must be completed and certified by a licensed land surveyor or engineer. The Elevation Certificate includes diagrams for several building types which indicate the various elevations that must be surveyed. Several points must be surveyed.

PAPERWORK IS IMPORTANT - FOR YOU AND YOUR COMMUNITY

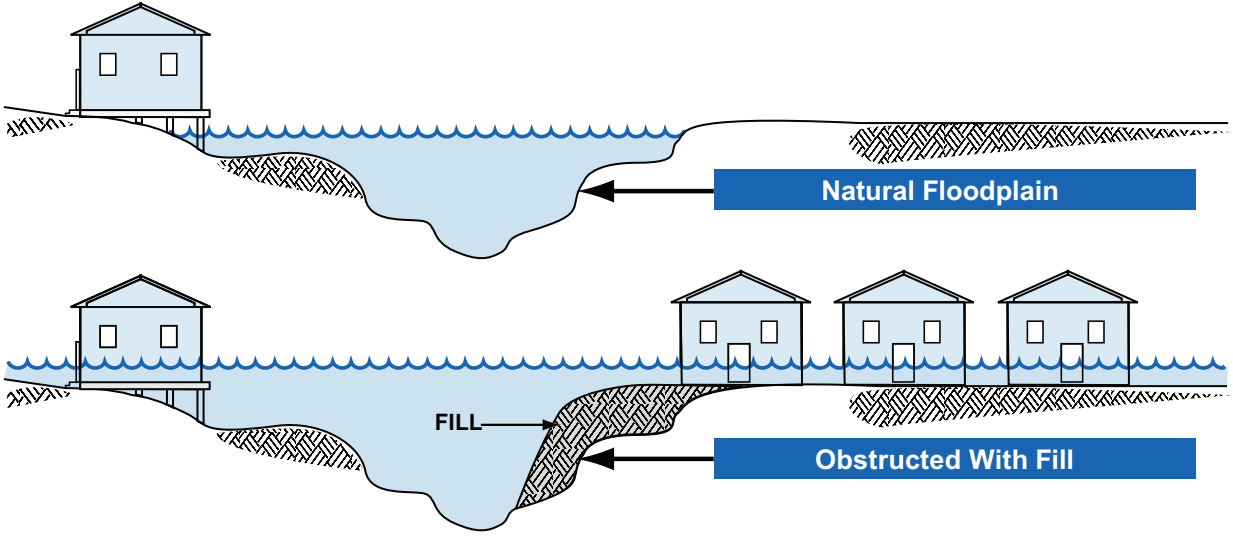
Terms and Definitions

The **Lowest Floor** of the lowest enclosed area (including basement). An unfinished or flood resistant enclosure, usable solely for parking of vehicles, building access, or storage in an area other than a basement area is not considered a building's lowest floor; provided that such enclosure is not built so as to render the structure in violation of the applicable non-elevation design requirements.



If you get a permit to build in the floodplain, you will be given an Elevation Certificate form. As soon as your lowest floor is set, get the form filled out and sealed by a surveyor or engineer. An "as-build" survey and Elevation Certificate will be required when construction is completed. **This form is important!** It proves that you built correctly, and it can be used to get the lowest cost flood insurance.

FLOODPLAIN FILL CAN MAKE THINGS WORSE



Floodplains are supposed to store floodwater. If storage space is filled with dirt and other fill, future flooding may be worsened. Your community may require an engineering analysis ("no rise" certificate) to show how floodplain fill will alter flooding. Floodplain fill can alter valuable floodplain functions, including wildlife habitat and wetlands.

Make sure your floodplain fill project won't harm your neighbors. Floodway fill is allowed **only** if an engineering evaluation demonstrates that "no rise" in flood level will occur (see page 34).

"NO RISE" IN THE FLOODWAY

- The floodway is the most dangerous part of the floodplain.
- Development is not allowed unless "no rise" in flood levels is certified. "No rise" means no increase in flood elevations greater than 0.00 feet.
- A registered professional engineer must evaluate the hydraulic impact of proposed development.
- Check with the Office of the State Engineer for guidance before you decide to work in a floodway.
- The State Engineer shall review all projects before a permit or authorization is allowed.

Important Information

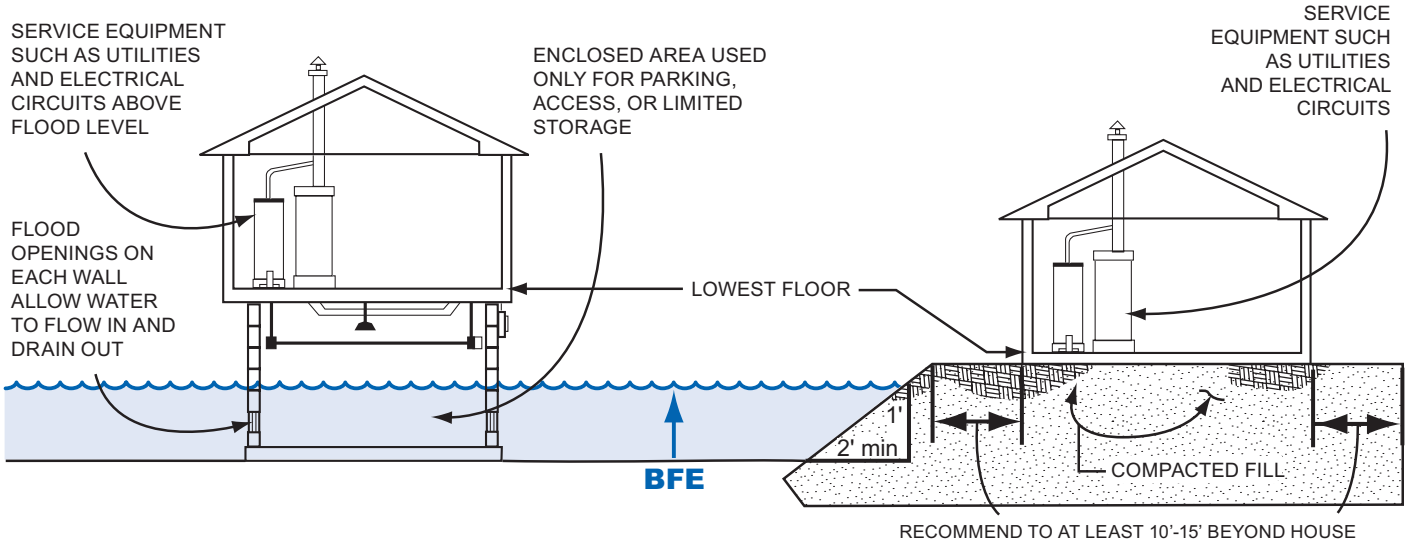
NOTE:
Please refer to North Dakota State Century Code, Chapter 61-16.2 for additional floodplain management regulations.

Save time and money – don't build in the floodway!

HOW TO ELEVATE YOUR FLOODPLAIN BUILDING

ELEVATE ON FOUNDATION

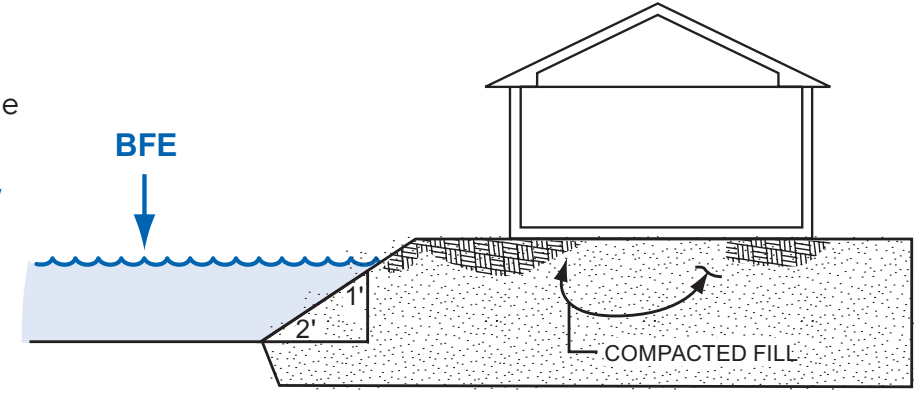
ELEVATE ON FILL



CAUTION! Enclosures (including crawlspaces) have some special requirements, see page 38. Note: When the walking surface of the lowest floor is at the minimum elevation, under-floor utilities are not allowed. Fill used to elevate buildings must be placed properly (see page 36).

CERTIFICATION OF FLOODPLAIN FILL

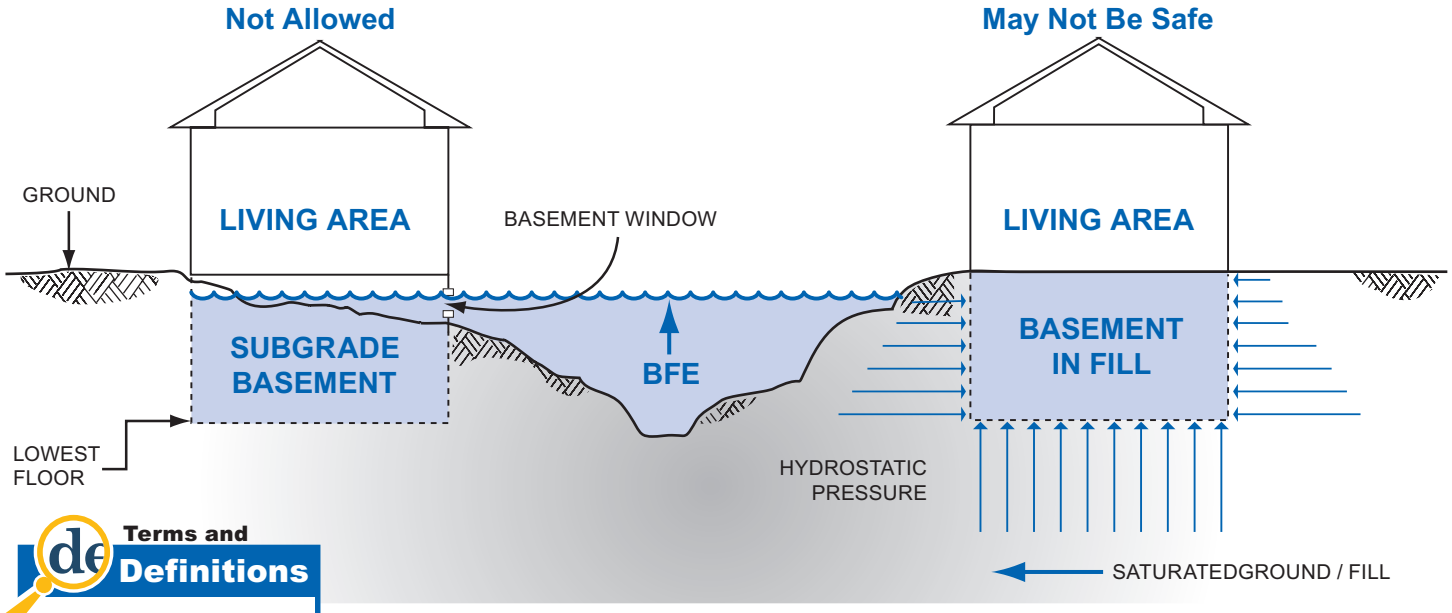
Earthen fill used to raise the ground above the base flood elevation must be placed properly so that it does not erode or slump when water rises. **For safety and to meet floodplain requirements, floodplain fill must:**



- Be good clean soil, free of large rocks, construction debris, and woody material (stumps, roots)
- Be machine compacted to 95 percent of the maximum density (determined by a design professional)
- Have graded side slopes that are not steeper than 2:1 (2 feet horizontal extent for every one foot vertical rise)
- Have slopes protected against erosion (vegetation for "low" velocities, durable materials for "high" velocities – determined by a design professional)

Your community will require certification of the elevation, compaction, slope, and slope protection materials in order to determine that the proposed structure will be "reasonably safe from flooding".

BASEMENTS ARE ESPECIALLY FLOODPRONE



Terms and Definitions

A **basement** is any portion of a structure that has a subgrade floor (below ground level) on all sides.

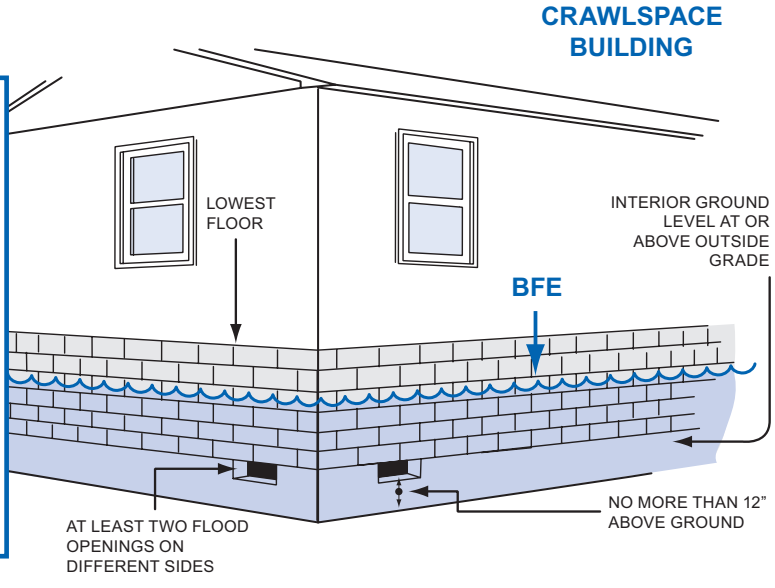
Basements below BFE are not allowed in new development and flood insurance coverage is very limited in existing basements for a very good reason. It only takes an inch of water over the sill and the entire basement can fill up! Excavating a basement into fill doesn't always make it safe because saturated groundwater can damage the walls. Basements below the BFE are not allowed in areas removed from the floodplain by a LOMR-F.

ENCLOSURES BELOW THE LOWEST FLOOR

Important Information

NOTE:

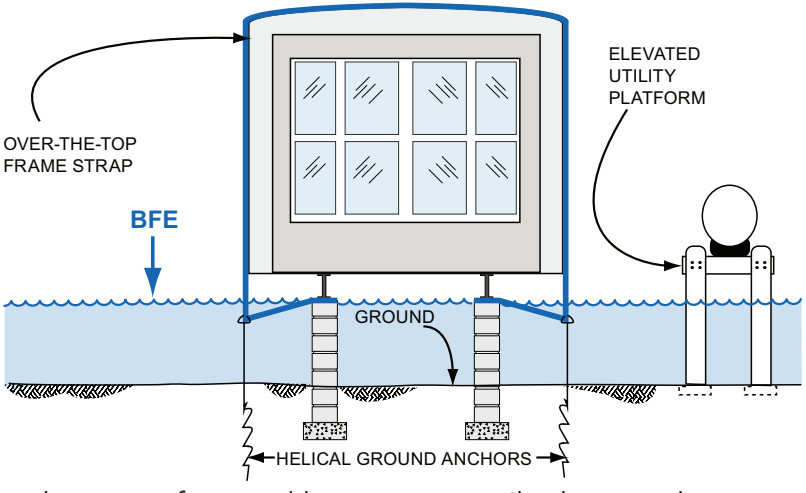
- Total net area of all total openings is 1 sq. inch per sq. foot of enclosed area
- A 30’ x 40’ building needs 1,200 sq. inches of openings
- If inserted in flood openings, typical air ventilation units must be disabled in the open position to allow water to flow in and out
- A typical air ventilation unit, with screen, provides 42 to 65 sq. inches of opening (look for “net free area” stamp on unit)

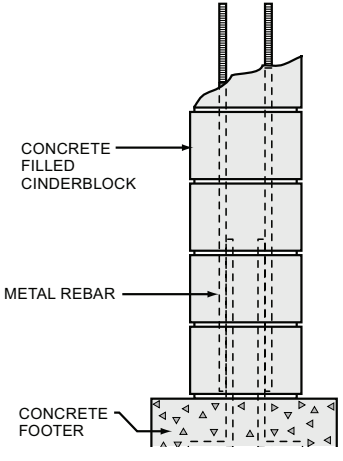


ALTERNATIVE: Engineered openings are acceptable **if certified** to allow adequate automatic inflow and outflow of floodwaters.

A crawlspace is an acceptable way to elevate just a couple of feet. In all cases, the following are required: openings/vents, elevated utilities, flood resistant materials, and limitation on use.

MANUFACTURED HOMES DESERVE SPECIAL ATTENTION



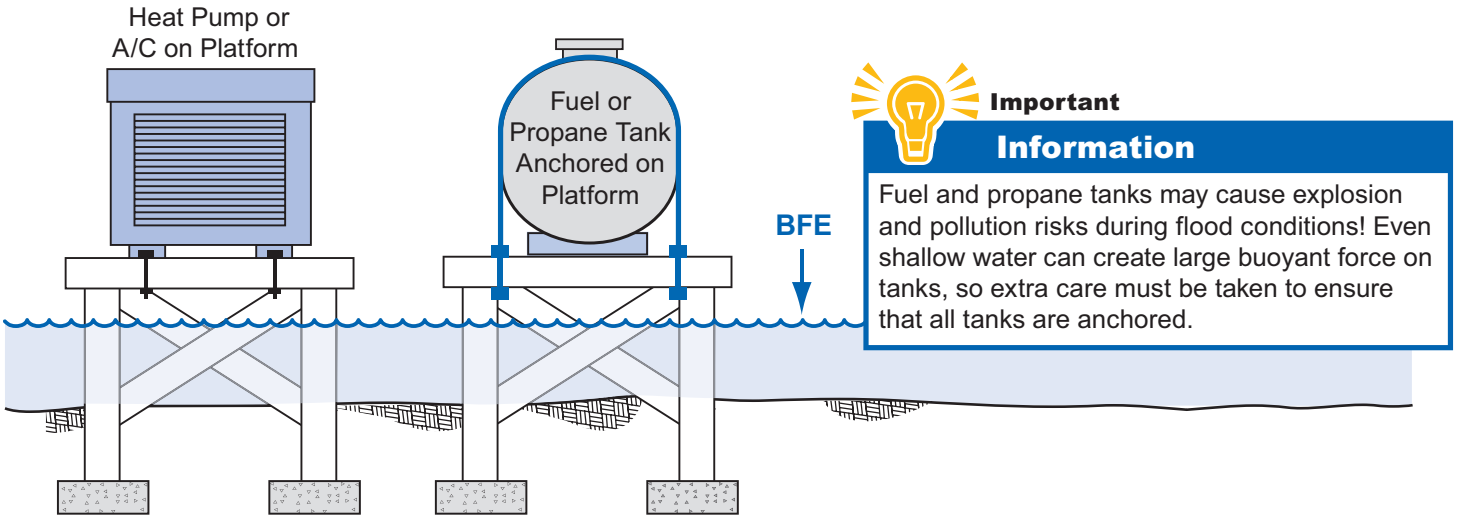


Experience shows that manufactured homes are easily damaged.
As little as one foot of water can cause substantial damage.

Dry stacked blocks are not acceptable – they will **NOT** withstand a flood.

Manufactured homes must be anchored to resist flotation, collapse, or lateral movement by being tied down in accordance with your community's ordinance, or the manufacturer's installation specifications.

UTILITY SERVICE OUTSIDE BUILDINGS



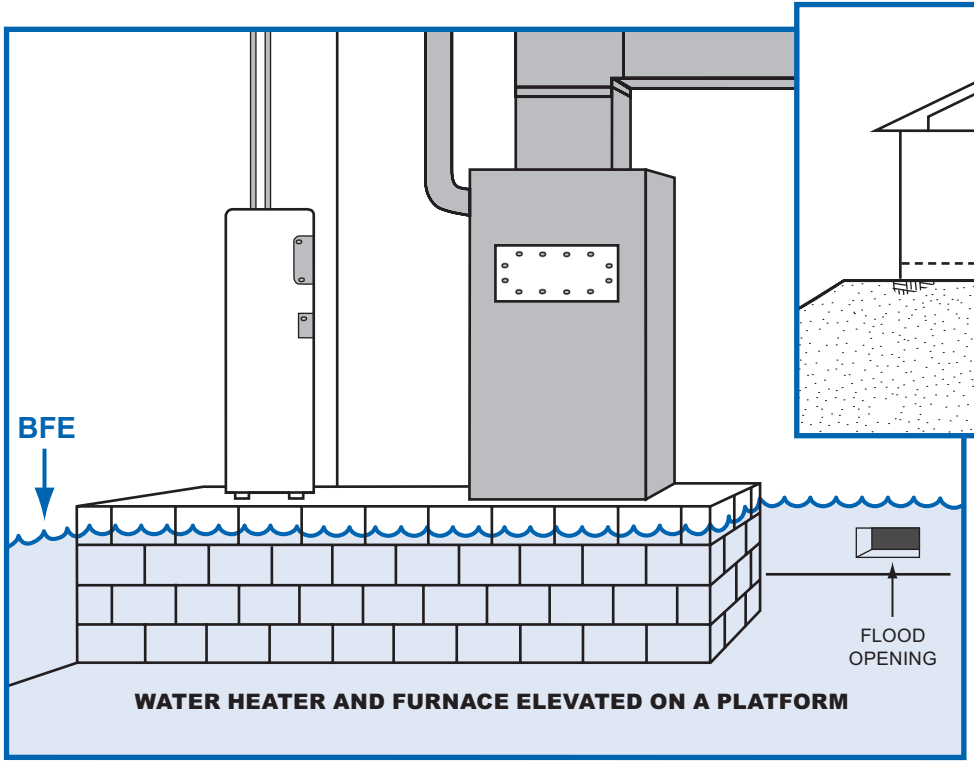
Important

Information

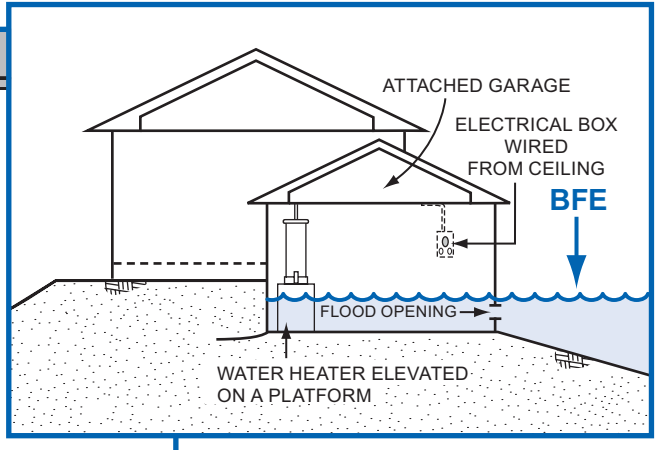
Fuel and propane tanks may cause explosion and pollution risks during flood conditions! Even shallow water can create large buoyant force on tanks, so extra care must be taken to ensure that all tanks are anchored.

All utilities, appliances, and equipment located outside must be elevated one foot above BFE or floodproofed to at least two feet above BFE. Utilities include plumbing, electrical, gas lines, fuel tanks, and heating and air conditioning equipment.

UTILITY SERVICE INSIDE ENCLOSURES



WATER HEATER AND FURNACE ELEVATED ON A PLATFORM

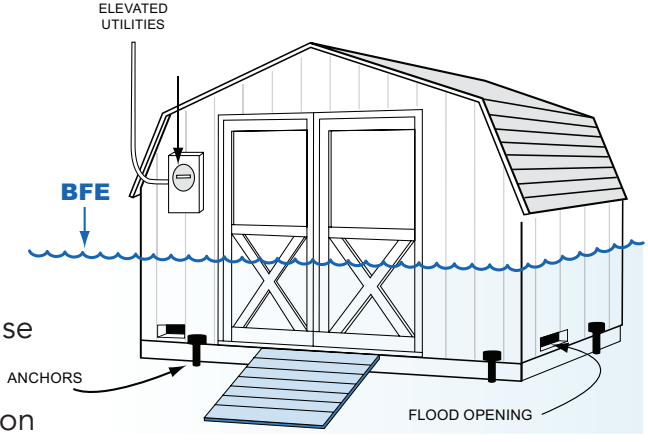


All utilities, appliances and equipment located inside enclosures must also be elevated one foot above BFE or protected two feet above BFE. Again, these utilities include plumbing, electrical, gas lines, heating and air conditioning.

ACCESSORY (APPURTENANT) STRUCTURES

In SFHA, accessory structures must:

- Not be habitable
- Be anchored to resist floating
- Have flood openings/vents
- Be built of flood resistant materials
- Have elevated utilities
- Be used only for storage or parking
- Not be modified for different use in the future
- Have documented floor elevation



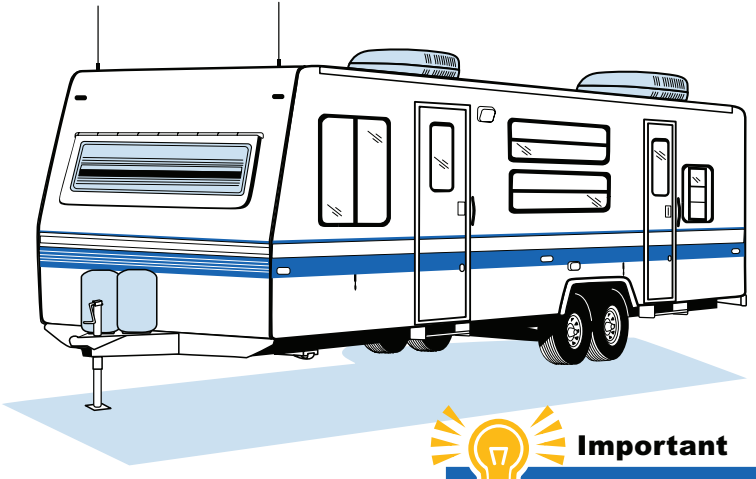
Terms and Definitions

Accessory (Appurtenant) Structure means a structure that is located on the same parcel of land as a principal structure and whose use is incidental to the use of the principle structure. Accessory structures should be no more than a minimal initial investment, may not be used for human habitation, and must be designed to minimize flood damages. Examples: detached garages, carports, storage sheds, pole barns, and hay sheds.

Even small buildings are "development" and permits or variances with noted conditions are required. They must be elevated or anchored and built to withstand flood damage.
Caution! Remember, everything inside is likely to get wet when flooding occurs.

In a SFHA, an RV must:

- Be licensed and titled as an RV or park model (not as a permanent residence)
- Be built on a single chassis
- Have inflated wheels and be self-propelled or towable by a light truck
- Have no attached deck, porch or shed
- Be used for temporary recreational, camping, travel, or seasonal use (no more than 180 days per year)
- Be less than 400 sq ft in area (measured at largest horizontal projection)
- Have quick-disconnect sewage, water, and electrical connectors



Important Information

Camping near the water? Ask the Campground or RV Park operator about flood warnings and plans for safe evacuations.

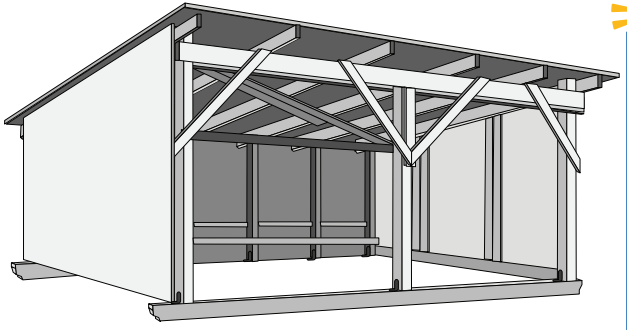
RVs that do not meet these conditions must be installed and elevated like manufactured homes, including permanent foundations and tie-downs (see page 39).

Variances are allowed for:

- Pole frame buildings
- Steel grain bins
- Steel frame corn cribs
- General purpose feeding barns open on one side

Variances are not allowed for:

- Livestock confinement buildings
- Poultry houses
- Dairy operations
- Similar livestock operations



Important Information

Farm houses are not agricultural structures.

Contact the State Water Commission for additional guidance on variances for agricultural structures.

The best flood protection is to elevate agricultural buildings, but certain types can be approved by variance if they are "wet floodproofed".

To obtain a permit to improve an existing building:

- You must provide a copy of your construction contract or a cost estimate (including estimated market value of your own or donated labor and materials).
- You may submit an independent assessment of the market value of the building, if performed by a licensed appraiser.
- Your community will compare the cost of the proposed work to the market value of the building and check the value of improvements.
- If the cost of the improvements equals or exceeds 50% of the market value of the building, it is considered a Substantial Improvement and you must bring the building into full compliance with your community floodplain ordinance.

Terms and Definitions

Substantial Improvement means any reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure before the start of construction of the improvement. This term includes structures which have incurred **Substantial Damage**, regardless of the actual repair work performed (see page 46).

Important Information

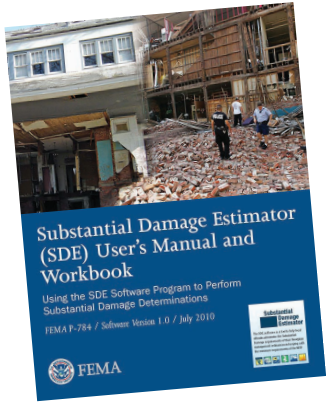
Floodplain buildings can be improved or altered, but special rules may apply!

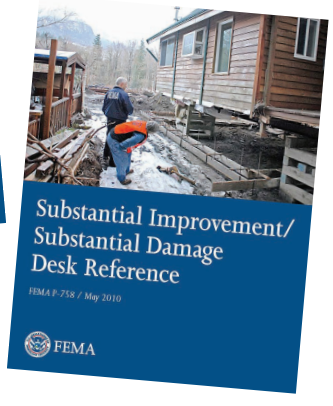
If the cost of an addition to a Pre-FIRM structure is less than 50% of its market value, only the addition is required to be built 1 foot above the BFE. Check with your local permit office.

The cost to correct previously cited violations of state or local health, sanitary, or safety codes to provide safe living conditions can be excluded.

Alteration of a registered historic structure is allowed, as long as it will continue to meet the criteria for listing as a historic structure.

REPAIRING DAMAGED BUILDINGS





- The Substantial Damage Estimator (SDE) User's Manual and Workbook (FEMA P-784) was developed to assist community officials in estimating building value and repair costs.
- The Substantial Improvement/Substantial Damage Desk Reference (FEMA P-758) provides practical guidance and suggested procedures to assist community officials in implementing substantial improvement and substantial damage requirements.
- These guidance documents can be downloaded from the FEMA Library at www.fema.gov/library

A permit is required to repair substantial damage from any cause – fire, flood, wind, or even a truck running into a building. Check with your community permit office before you begin repairs. You will be asked to provide a detailed cost estimate to repair the building to its pre-damaged condition. If the repair costs are 50% or more of the pre-damage market value of the building, then the building is Substantial Improved and you must bring the building into full compliance. See page 48 for more information about elevating an existing building on a crawlspace.

USE THE ICC CLAIM TO:

ELEVATE THE HOUSE ON YOUR LOT

DEMOLISH and REBUILD THE HOUSE

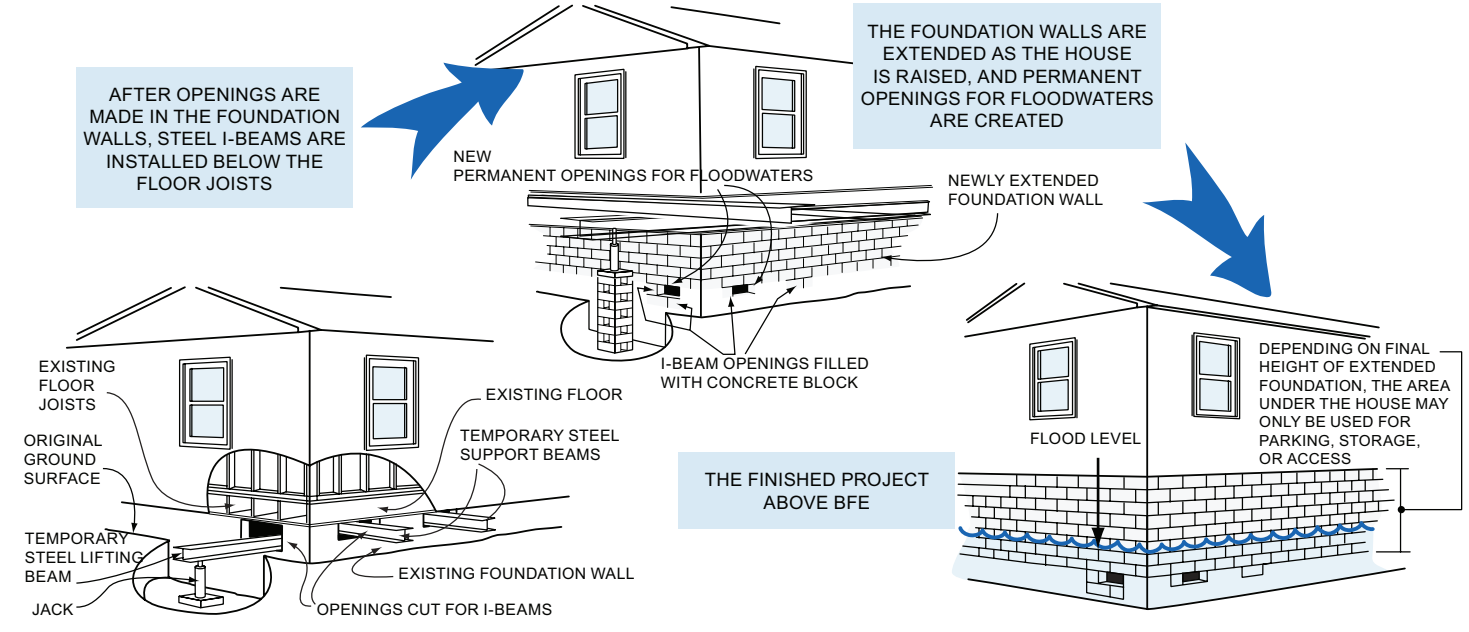
MOVE THE HOUSE TO HIGH GROUND

You may be eligible for up to $30,000 to help pay the costs to bring your building into compliance with your community's requirements – if all of the following apply:

- You have a NFIP flood insurance policy – it includes Increased Cost of Compliance (ICC) coverage.
- Your building is in the mapped Special Flood Hazard Area (SFHA).
- Your building's lowest floor is below the elevation required by your community.
- Your community has made an official determination that the building was substantially damaged by flooding.
- You act quickly with your claims adjuster and community official to process all the required paperwork.

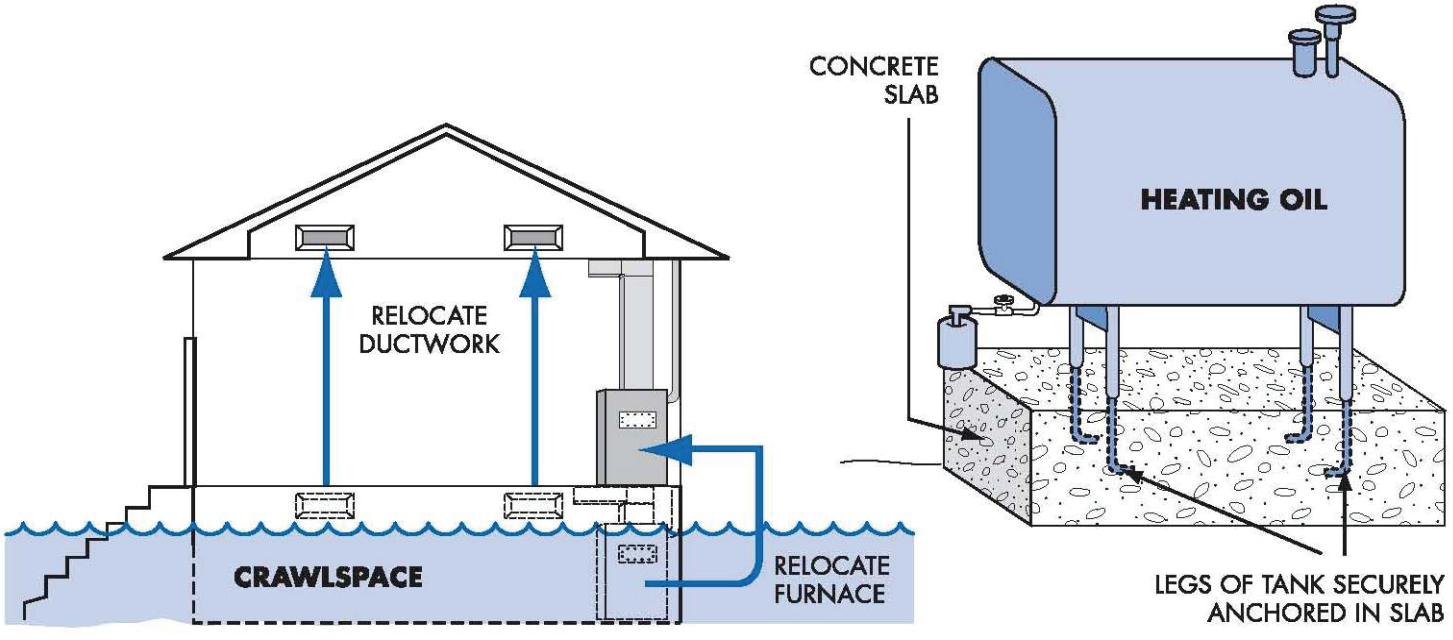
Owners of substantially damaged buildings are required to "bring the building into compliance" with floodplain requirements. Substantial damage is a special case of substantial improvement.

ELEVATING A PRE-FIRM BUILDING



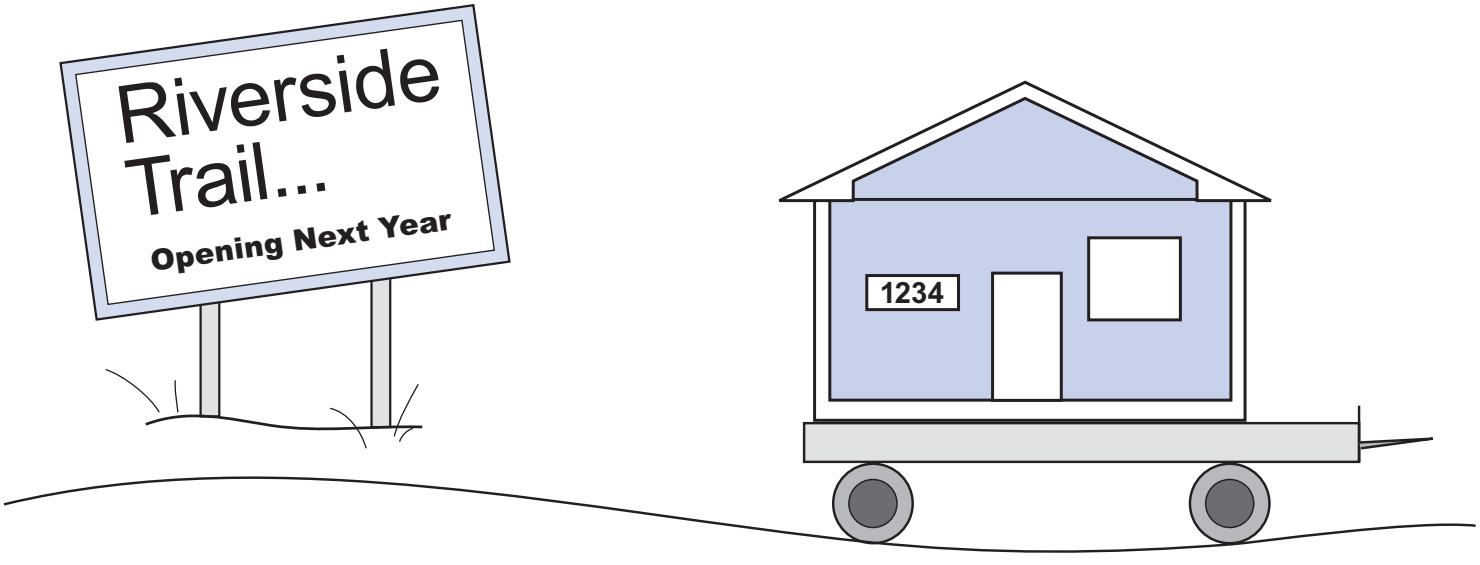
This is one way to elevate an existing building to comply with floodplain regulations. The state and FEMA can help with more information and options.

SOME FLOOD PROTECTION FOR OLDER HOMES IS EASY AND LOW COST



Move your hot water heater and furnace out of the basement; or build small platforms for them. Anchor heating oil and propane gas tanks to prevent floatation. **Do not** store valuables in a floodprone basement. Use water-resistant materials when you repair.

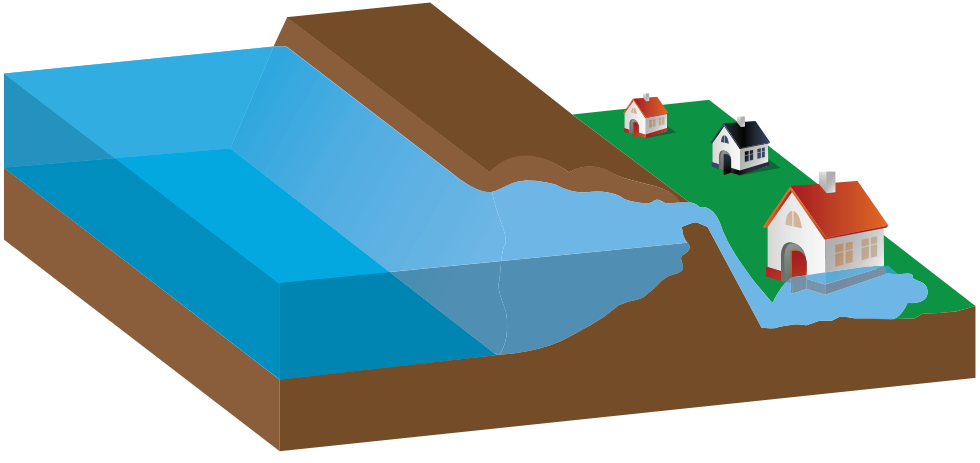
But Give You More Protection



After floods, some communities buy out and demolish homes that were severely damaged. The acquired land is dedicated to open space and can be used for recreation or to help restore wildlife habitat and wetlands. Homes have been lifted up on higher foundations, and others have been moved to safer high ground.

Living with levees is a shared responsibility among the whole community; know your risk, know your role, and take action today!

- Levees and levee systems are designed to provide a specific level of risk reduction.
- The levee owner (typically a local community or Water Resource District) is responsible for proper operation and maintenance.
- When levees fail, or are overtopped, the results can be catastrophic.



Terms and Definitions

A **Levee** is a man-made structure, usually an earthen embankment, designed and constructed in accordance with sound engineering practices to contain, control, or divert the flow of water so as to provide risk reduction from temporary flooding.

LEVEES NEED A PERMIT

In addition to a floodplain development permit from your local permitting authority, **a permit from the Office of the State Engineer is required** for all levees capable of obstructing or diverting fifty acre-feet of water or more. The capacity is determined by measuring the protected volume behind a levee from the effective top of the structure.

Permanent Levees

- The presence of a levee in the floodplain or floodway will require the completion of an impact analysis.
- Applicants must have property rights to all properties affected by the levees.

Temporary Emergency Levees

- During a flood emergency, an expedited permitting process is authorized for temporary levees.
- Emergency Construction permits expire after six months
- The applicant must notify the State Engineer in writing when the emergency levee has been completely removed.

For complete regulations, please refer to North Dakota Century Code 61-03, 61-04, and 61-16.1-38.

FEMA LEVEE ACCREDITATION

If the levee satisfies the regulatory design, maintenance, and operation criteria, FEMA will "accredit" the levee system as providing adequate risk reduction on the FIRM and the levee-impacted area will be shown as a moderate-risk area, labeled Zone X (shaded). Without this accreditation, the FIRM will show the impacted area as being within the Special Flood Hazard Area.

For additional FEMA accreditation information, please refer to 44 CFR 65.10 for NFIP regulations.

To learn more about levees, contact your local community official or the Office of the State Engineer. Additional information is also provided on FEMA's Living with Levees webpage (see page 57).

FEMA

Many people living or working near a levee believe that it will always protect them from flooding. Although levees may be designed to the highest engineering standards, **levees can and do fail**. Protect yourself with flood insurance!

THE NFIP'S COMMUNITY RATING SYSTEM (CRS)

The NFIP's CRS is a voluntary program that provides communities the opportunity to reduce flood insurance premiums for its citizens. Communities must apply to the CRS and commit to implement and certify activities that contribute to reduced flood risk. **Examples of actions your community can take to reduce the cost of your insurance premiums include:**

- Preserve open space in the floodplain
- Enforce higher standards for safer development
- Undertake engineering studies and prepare flood maps
- Obtain grants to buy out or elevate houses or to floodproof businesses
- Maintain drainage systems
- Monitor flood conditions and issue warnings
- Inform people about flood hazards, flood insurance, and how to reduce flood damage

Community officials can request assistance from CRS specialists to help with the application process and prerequisites. Check the online CRS Resources Center (see page 57).

BE FLOOD SAFE - DON'T DRIVE THROUGH FLOODED ROADS

- Flooding is the leading cause of severe weather-related deaths in the U.S.
- Flooded roads, bridges, and culverts may be washed out.
- Passenger cars may float in only 12-18 inches of flowing water.
- Floating cars easily get swept downstream, making it difficult to be rescued.
- Most people who die in floods are trapped in vehicles that become submerged.
- In 2013, three people died in North Dakota trying to cross flooded roadways.

FLASH FLOODS ARE DANGEROUS!

Do not try to walk or drive through moving water.

WANT TO LEARN MORE?

- For advice on flood information and permits, call your community's building permitting office or planning department.
- The North Dakota State Water Commission coordinates the National Flood Insurance Program, on-line information is available at **http://www.swc.nd.gov**.
- To order flood maps, call FEMA's Map Service Center at **1(877) FEMAMAP** or order on-line at **http://msc.fema.gov**.
- Learn more about flood maps and check the status of Map Change Requests at **http://www.fema.gov/national-flood-insurance-program/flood-map-information**.
- You can order printed copies of FEMA publications from the FEMA Distribution Center. To place an order, call **1(800) 480-2520**.
- FEMA's on-line publications can be found in the FEMA Virtual Library. Many are posted in the Portable Document Format (PDF). Go to **http://www.fema.gov/library** for more information.
- To learn about flood insurance, call your insurance agent. Most insurance companies can write an NFIP policy for you. If you need more help, call the National Flood Insurance Program's toll free number to get the name of an agent in your area who does write flood insurance. The number is **1(888) 379-9531**.
- To get the best rates for flood insurance, call a local surveyor to complete an Elevation Certificate.
- For additional information about flood insurance, visit **www.floodsmart.gov**.

COMMON ACRONYMS AND USEFUL RESOURCES

Common Acronyms

- BFE = Base Flood Elevation
- EC = Elevation Certificate
- FEMA = Federal Emergency Management Agency
- FIRM = Flood Insurance Rate Map
- NFIP = National Flood Insurance Program
- SFHA = Special Flood Hazard Area

Useful Resources

- Family disaster planning: **http://www.redcross.org/prepare/location/home-family**
- Information for flood victims: **http://www.fema.gov/survivor-resources**
- CRS Resource Center: **http://training.fema.gov/EMIWeb/CRS**
- Protecting Your Property or Business from Disaster: **http://www.fema.gov/protect-your-property-or-business-disaster**
- Living with Levees: **http://www.fema.gov/living-levees-its-shared-responsibility**

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